



SEQUENCE LISTING

<110> MAOKA, Tetsuo
HATAYA, Tatsuji

<120> Full-length Genomic RNA of Papaya Leaf-Distortion Mosaic Virus

<130> 382.1036

<140> 10/076,839

<141> 2002-02-15

<150> JP 2001-040523

<151> 2001-02-16

<160> 4

<170> PatentIn Ver. 2.0

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<212> RNA

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ccc	aca	uug	aga	aug	cga	gga	aug	uca	ucu	uuu	gga	ucu	agu	aaU	aua	4587
Pro	Thr	Leu	Arg	Met	Arg	Gly	Met	Ser	Ser	Phe	Gly	Ser	Ser	Asn	Ile	
			1470			1475					1480					
ugu	aua	aug	acu	agu	gga	uuu	gcu	uuc	aaU	uac	uuu	gca	aaU	aaU	ccu	4635
Cys	Ile	Met	Thr	Ser	Gly	Phe	Ala	Phe	Asn	Tyr	Phe	Ala	Asn	Asn	Pro	
					1490				1495						1500	
cua	aaa	uua	agu	gau	uuu	gaa	uuu	gug	aua	aua	gau	gag	ugu	cac	guc	4683
Leu	Lys	Leu	Ser	Asp	Phe	Glu	Phe	Val	Ile	Ile	Asp	Glu	Cys	His	Val	
				1505					1510					1515		
cua	gau	agc	aac	gcu	aug	gca	uuc	gug	ugu	cuu	cuc	aaa	gaa	cac	aac	4731
Leu	Asp	Ser	Asn	Ala	Met	Ala	Phe	Val	Cys	Leu	Leu	Lys	Glu	His	Asn	
			1520					1525					1530			
uau	gau	ggc	aaa	cua	uug	aaa	gug	uca	gcc	aca	cca	cag	ggc	cgu	gaa	4779
Tyr	Asp	Gly	Lys	Leu	Leu	Lys	Val	Ser	Ala	Thr	Pro	Gln	Gly	Arg	Glu	
			1535				1540					1545				
ugu	gaa	uuc	cac	aca	cag	cau	cca	guu	ucc	auu	cau	aua	gag	gaa	caa	4827
Cys	Glu	Phe	His	Thr	Gln	His	Pro	Val	Ser	Ile	His	Ile	Glu	Glu	Gln	
			1550			1555					1560					
cuu	agu	uuc	caa	gcu	uuu	ugu	gaa	gcu	caa	gga	acu	ggg	ucu	gca	cga	4875
Leu	Ser	Phe	Gln	Ala	Phe	Cys	Glu	Ala	Gln	Gly	Thr	Gly	Ser	Ala	Arg	
				1570						1575					1580	
gau	gua	auc	aaU	aag	gga	gac	aac	auu	uua	gug	uau	guu	gcu	agu	uac	4923
Asp	Val	Ile	Asn	Lys	Gly	Asp	Asn	Ile	Leu	Val	Tyr	Val	Ala	Ser	Tyr	
				1585				1590					1595			
aaU	gag	guu	gau	cag	cuc	uca	aaa	aug	cuc	gga	gau	aaa	ggc	uau	uua	4971
Asn	Glu	Val	Asp	Gln	Leu	Ser	Lys	Met	Leu	Gly	Asp	Lys	Gly	Tyr	Leu	
			1600					1605					1610			
gug	acu	aaa	guc	gau	ggg	cgu	acc	aug	aaa	auu	ggg	ucg	acc	gac	aua	5019

Val	Thr	Lys	Val	Asp	Gly	Arg	Thr	Met	Lys	Ile	Gly	Ser	Thr	Asp	Ile		
		1615					1620					1625					
guu	acu	aaa	ggg	agu	agc	cag	aag	aaa	cau	uuc	auu	gua	gca	acc	aac	5067	
Val	Thr	Lys	Gly	Ser	Ser	Gln	Lys	Lys	His	Phe	Ile	Val	Ala	Thr	Asn		
		1630				1635					1640						
aua	auc	gag	aaU	gga	guc	acu	cua	gau	gua	gau	guu	guu	gug	gac	uuu	5115	
Ile	Ile	Glu	Asn	Gly	Val	Thr	Leu	Asp	Val	Asp	Val	Val	Val	Asp	Phe		
		1645			1650					1655					1660		
ggU	uug	aaa	guc	acu	gcu	gaa	auu	gau	uac	gac	aac	cgg	ugc	guu	aaU	5163	
Gly	Leu	Lys	Val	Thr	Ala	Glu	Ile	Asp	Tyr	Asp	Asn	Arg	Cys	Val	Asn		
			1665						1670					1675			
uac	aca	aag	acc	agc	auu	uca	uac	gga	gaa	cgc	aua	caa	aga	uug	ggc	5211	
Tyr	Thr	Lys	Thr	Ser	Ile	Ser	Tyr	Gly	Glu	Arg	Ile	Gln	Arg	Leu	Gly		
			1680					1685					1690				
agg	guu	ggU	aga	cac	aag	aaa	ggg	cau	gca	aug	aga	auu	gga	acu	aca	5259	
Arg	Val	Gly	Arg	His	Lys	Lys	Gly	His	Ala	Met	Arg	Ile	Gly	Thr	Thr		
		1695					1700					1705					
auu	aaa	gga	uug	auu	gag	auu	ccu	agu	cuu	gug	gcg	aca	cag	gcu	gca	5307	
Ile	Lys	Gly	Leu	Ile	Glu	Ile	Pro	Ser	Leu	Val	Ala	Thr	Gln	Ala	Ala		
		1710				1715					1720						
uuu	caa	ugc	uuc	aca	uau	gga	uug	ccu	gua	aug	aca	caa	gga	guu	uca	5355	
Phe	Gln	Cys	Phe	Thr	Tyr	Gly	Leu	Pro	Val	Met	Thr	Gln	Gly	Val	Ser		
		1725			1730					1735					1740		
guu	aac	agu	uua	uca	aaU	ugc	aca	guc	cga	cag	gcc	aga	guu	aug	ucu	5403	
Val	Asn	Ser	Leu	Ser	Asn	Cys	Thr	Val	Arg	Gln	Ala	Arg	Val	Met	Ser		
				1745				1750					1755				
cgu	uuu	gag	uug	ccg	ccu	uac	uuu	aug	gcu	uca	cuu	gua	uau	cau	gau	5451	
Arg	Phe	Glu	Leu	Pro	Pro	Tyr	Phe	Met	Ala	Ser	Leu	Val	Tyr	His	Asp		
		1760						1765				1770					
ggc	agc	aug	cac	ccu	gaa	auu	cac	aag	cau	uua	auu	ccu	uac	aag	uua	5499	
Gly	Ser	Met	His	Pro	Glu	Ile	His	Lys	His	Leu	Ile	Pro	Tyr	Lys	Leu		
		1775					1780					1785					
gau	gaa	ucu	gaa	auu	caa	cuu	agu	gcc	aug	gcu	uuu	aac	uuu	acc	gua	5547	
Asp	Glu	Ser	Glu	Ile	Gln	Leu	Ser	Ala	Met	Ala	Phe	Asn	Phe	Thr	Val		
		1790				1795					1800						
aca	ucu	auu	ugg	cua	gau	ugu	aaa	uuu	uau	gac	agu	aua	gga	auc	cau	5595	
Thr	Ser	Ile	Trp	Leu	Asp	Cys	Lys	Phe	Tyr	Asp	Ser	Ile	Gly	Ile	His		
		1805			1810					1815					1820		
cuu	gau	uua	ccg	cgc	gaa	gca	aaa	auu	cca	uuc	cau	ugu	aga	gaa	uuc	5643	
Leu	Asp	Leu	Pro	Arg	Glu	Ala	Lys	Ile	Pro	Phe	His	Cys	Arg	Glu	Phe		
				1825					1830					1835			
cca	gau	aug	aaa	uac	cga	cac	uug	ugg	gaa	gau	auu	cuc	aaa	auc	aag	5691	
Pro	Asp	Met	Lys	Tyr	Arg	His	Leu	Trp	Glu	Asp	Ile	Leu	Lys	Ile	Lys		
			1840				1845					1850					
agc	aua	aaU	ugu	uuu	ggU	aga	aug	agu	guu	guu	agc	gca	aca	aaa	gua	5739	
Ser	Ile	Asn	Cys	Phe	Gly	Arg	Met	Ser	Val	Val	Ser	Ala	Thr	Lys	Val		
		1855					1860					1865					
gca	uau	aca	cuu	aaa	aca	gac	auu	cau	uca	auu	gga	aaa	acu	cuc	gga	5787	

Ala	Tyr	Thr	Leu	Lys	Thr	Asp	Ile	His	Ser	Ile	Gly	Lys	Thr	Leu	Gly	
1870						1875					1880					
uau	auu	gac	gcc	cuc	uug	caa	gaa	gaa	uau	aga	aaa	cag	cau	cau	uuu	5835
Tyr	Ile	Asp	Ala	Leu	Leu	Gln	Glu	Glu	Tyr	Arg	Lys	Gln	His	His	Phe	
1885					1890					1895					1900	
aaa	gca	aug	aca	agu	aac	gca	ugu	agu	ggg	aac	acu	uuu	uca	aug	cua	5883
Lys	Ala	Met	Thr	Ser	Asn	Ala	Cys	Ser	Gly	Asn	Thr	Phe	Ser	Met	Leu	
				1905					1910					1915		
agc	aua	gca	aaU	gca	aua	cgg	aac	cac	uau	gcu	aag	gac	uac	acu	gcu	5931
Ser	Ile	Ala	Asn	Ala	Ile	Arg	Asn	His	Tyr	Ala	Lys	Asp	Tyr	Thr	Ala	
			1920					1925					1930			
ggc	aaU	auu	cag	aaa	uug	cag	gca	gca	aag	aaU	caa	aua	cug	gaa	uuc	5979
Gly	Asn	Ile	Gln	Lys	Leu	Gln	Ala	Ala	Lys	Asn	Gln	Ile	Leu	Glu	Phe	
		1935					1940					1945				
guc	aaU	uua	aaU	cuu	gau	ccu	ucg	gcg	aaa	ugc	gga	uuc	caa	gag	uuc	6027
Val	Asn	Leu	Asn	Leu	Asp	Pro	Ser	Ala	Lys	Cys	Gly	Phe	Gln	Glu	Phe	
	1950					1955					1960					
gga	gcu	uua	gaa	cua	guu	acc	cau	cag	agc	agg	caa	gaa	auu	uca	aaa	6075
Gly	Ala	Leu	Glu	Leu	Val	Thr	His	Gln	Ser	Arg	Gln	Glu	Ile	Ser	Lys	
1965					1970					1975					1980	
uuu	cua	aaU	cug	aga	ggu	aag	ugg	aaU	aag	uca	cua	auu	aca	cgu	gau	6123
Phe	Leu	Asn	Leu	Arg	Gly	Lys	Trp	Asn	Lys	Ser	Leu	Ile	Thr	Arg	Asp	
				1985					1990					1995		
auc	uua	guu	uug	uua	ggu	guc	acu	auu	ggu	ggu	uuc	ugg	aug	aua	ugg	6171
Ile	Leu	Val	Leu	Leu	Gly	Val	Thr	Ile	Gly	Gly	Phe	Trp	Met	Ile	Trp	
			2000					2005				2010				
gau	aag	uuc	aaa	uca	aac	auu	gaa	gaa	guu	cau	cau	gaa	gga	aag	agg	6219
Asp	Lys	Phe	Lys	Ser	Asn	Ile	Glu	Glu	Val	His	His	Glu	Gly	Lys	Arg	
		2015					2020					2025				
aag	acu	caa	aag	cuu	aaa	uuu	cgg	gau	gcu	cgc	gau	aag	aaa	aug	ggu	6267
Lys	Thr	Gln	Lys	Leu	Lys	Phe	Arg	Asp	Ala	Arg	Asp	Lys	Lys	Met	Gly	
	2030					2035					2040					
cga	gaa	gua	uau	gga	gac	gac	ggu	acu	auu	gaa	cau	uac	uuu	gga	ucg	6315
Arg	Glu	Val	Tyr	Gly	Asp	Asp	Gly	Thr	Ile	Glu	His	Tyr	Phe	Gly	Ser	
2045				2050						2055					2060	
gca	uac	guc	aag	aga	ggu	gca	guu	aag	ggc	cag	aag	aga	gga	aug	ggc	6363
Ala	Tyr	Val	Lys	Arg	Gly	Ala	Val	Lys	Gly	Gln	Lys	Arg	Gly	Met	Gly	
				2065					2070					2075		
gaa	aaa	uca	aga	cgu	uuc	guu	agu	aug	uau	gga	guu	aaU	uua	gaa	gau	6411
Glu	Lys	Ser	Arg	Arg	Phe	Val	Ser	Met	Tyr	Gly	Val	Asn	Leu	Glu	Asp	
			2080					2085					2090			
uuu	gcu	uuu	auu	aga	uac	aua	gau	ccc	aua	acu	gga	gca	acg	cgu	gau	6459
Phe	Ala	Phe	Ile	Arg	Tyr	Ile	Asp	Pro	Ile	Thr	Gly	Ala	Thr	Arg	Asp	
		2095					2100					2105				
gag	agu	ccu	uug	aca	gau	gug	gaa	uua	gug	caa	gcu	cau	uuc	gga	gaa	6507
Glu	Ser	Pro	Leu	Thr	Asp	Val	Glu	Leu	Val	Gln	Ala	His	Phe	Gly	Glu	
	2110					2115					2120					
auc	aga	gac	aaa	aug	cua	gac	gag	ggc	cuc	auc	gau	agg	caa	cac	auc	6555

Ile Arg Asp Lys Met Leu Asp Glu Gly Leu Ile Asp Arg Gln His Ile 2125 2130 2135 2140	
uua aaU aaa cca ggu uug aca gca uac uua guu aag gac ggg guu aag Leu Asn Lys Pro Gly Leu Thr Ala Tyr Leu Val Lys Asp Gly Val Lys 2145 2150 2155	6603
ucc auc aug aaa gua gau uug caa cca cac aaU ccu cua cuc aua ugc Ser Ile Met Lys Val Asp Leu Gln Pro His Asn Pro Leu Leu Ile Cys 2160 2165 2170	6651
aaa aac aaa gcg aca aua gca ggg uuu ccu gag aag gag uuu guu uug Lys Asn Lys Ala Thr Ile Ala Gly Phe Pro Glu Lys Glu Phe Val Leu 2175 2180 2185	6699
cga caa acg gac aaa gca uau gaa gua agu aga gag gaa cua cca gaa Arg Gln Thr Asp Lys Ala Tyr Glu Val Ser Arg Glu Glu Leu Pro Glu 2190 2195 2200	6747
cgg aaU gaa gac guu ucu uuu gaa gga gcc uca agu gug aag gga uug Arg Asn Glu Asp Val Ser Phe Glu Gly Ala Ser Ser Val Lys Gly Leu 2205 2210 2215 2220	6795
cgc gau uac aaU ggu gua gcc agc gcU auu ugc caa cuc aca aac aac Arg Asp Tyr Asn Gly Val Ala Ser Ala Ile Cys Gln Leu Thr Asn Asn 2225 2230 2235	6843
uca aaU ggu cgg ucc acc aca acu uau ggg guu ggc uuu ggc uca uac Ser Asn Gly Arg Ser Thr Thr Tyr Gly Val Gly Phe Gly Ser Tyr 2240 2245 2250	6891
auc aua guu aaU agg cac uug uuu aaa gaa aaU aaU ggg aaU uua uug Ile Ile Val Asn Arg His Leu Phe Lys Glu Asn Asn Gly Asn Leu Leu 2255 2260 2265	6939
auc aaa ucg acg cau gga aaU uuc aaU auc agg aac ucc aag caa auu Ile Lys Ser Thr His Gly Asn Phe Asn Ile Arg Asn Ser Lys Gln Ile 2270 2275 2280	6987
aaa guc guc gga gug gag gau agg gau auu gcc auu cuu caa aug ccu Lys Val Val Gly Val Glu Asp Arg Asp Ile Ala Ile Leu Gln Met Pro 2285 2290 2295 2300	7035
aaa gac uuc cca ccc uuu gca cag agg uua cga uuu aga aaU cca aua Lys Asp Phe Pro Pro Phe Ala Gln Arg Leu Arg Phe Arg Asn Pro Ile 2305 2310 2315	7083
gug ggu gaa uca auu ugu cuu guu gga aaU acg uuc caa gaa aag uac Val Gly Glu Ser Ile Cys Leu Val Gly Asn Thr Phe Gln Glu Lys Tyr 2320 2325 2330	7131
aaU gca agc auc guu ucu gag aca agc aaU aca uuc cca cga guu gaa Asn Ala Ser Ile Val Ser Glu Thr Ser Lys Thr Phe Pro Arg Val Glu 2335 2340 2345	7179
ggu agu uuu ugg aaa cau ugg auu aaU aca acg gaa gga cau ugu gga Gly Ser Phe Trp Lys His Trp Ile Asn Thr Thr Glu Gly His Cys Gly 2350 2355 2360	7227
uug ccu uua guu agu guc acu gau gga uuu auu gua gga aua cau agu Leu Pro Leu Val Ser Val Thr Asp Gly Phe Ile Val Gly Ile His Ser 2365 2370 2375 2380	7275
uua aug agu cau aag uac gau cau aaU uau uuc ucg aac uuu gac gac	7323

Leu	Met	Ser	His	Lys	Tyr	Asp	His	Asn	Tyr	Phe	Ser	Asn	Phe	Asp	Asp	
				2385					2390					2395		
gcg	uuu	gaa	ggc	gau	uau	auu	aac	aag	uug	aag	gaa	cug	aaa	ugg	gag	7371
Ala	Phe	Glu	Gly	Asp	Tyr	Ile	Asn	Lys	Leu	Lys	Glu	Leu	Lys	Trp	Glu	
			2400					2405					2410			
cag	aaU	ugg	acu	uac	aac	guu	aaU	acu	guu	agu	ugg	ggc	aac	aug	aaa	7419
Gln	Asn	Trp	Thr	Tyr	Asn	Val	Asn	Thr	Val	Ser	Trp	Gly	Asn	Met	Lys	
		2415					2420					2425				
cuu	cag	gau	agu	gcu	cca	ugc	aaa	gaa	uuc	aaa	aca	acu	aag	uug	auu	7467
Leu	Gln	Asp	Ser	Ala	Pro	Cys	Lys	Glu	Phe	Lys	Thr	Thr	Lys	Leu	Ile	
	2430					2435					2440					
agc	gac	uua	ugc	acg	gaa	ccu	gug	ugc	gcu	cag	agu	agc	aaU	caa	guu	7515
Ser	Asp	Leu	Cys	Thr	Glu	Pro	Val	Cys	Ala	Gln	Ser	Ser	Asn	Gln	Val	
2445					2450					2455					2460	
aga	ugg	uua	uau	aaU	cag	cuu	gaa	gga	aaU	uug	aaa	gcg	guu	gca	acu	7563
Arg	Trp	Leu	Tyr	Asn	Gln	Leu	Glu	Gly	Asn	Leu	Lys	Ala	Val	Ala	Thr	
				2465				2470					2475			
auu	ccc	aaU	aac	uuu	guu	aca	aag	cac	auu	gug	aaa	gga	cga	ugu	aaa	7611
Ile	Pro	Asn	Asn	Phe	Val	Thr	Lys	His	Ile	Val	Lys	Gly	Arg	Cys	Lys	
			2480					2485				2490				
uug	uuu	gaa	uug	uau	cug	caa	acu	cgu	agu	gaa	gcg	aaU	gag	uuc	uuu	7659
Leu	Phe	Glu	Leu	Tyr	Leu	Gln	Thr	Arg	Ser	Glu	Ala	Asn	Glu	Phe	Phe	
		2495					2500					2505				
aaa	cca	cug	aug	ggU	uuc	uau	ggg	aag	agc	ggU	cuc	aac	aag	gaa	gca	7707
Lys	Pro	Leu	Met	Gly	Phe	Tyr	Gly	Lys	Ser	Gly	Leu	Asn	Lys	Glu	Ala	
	2510					2515					2520					
uac	auu	aag	gac	cua	uuu	aaa	uac	uca	uca	gaa	aua	cca	auu	ggg	gag	7755
Tyr	Ile	Lys	Asp	Leu	Phe	Lys	Tyr	Ser	Ser	Glu	Ile	Pro	Ile	Gly	Glu	
2525					2530					2535					2540	
guc	gac	acu	gag	aga	uuu	gaa	gau	gca	guu	ggg	caa	guc	auc	gaa	auu	7803
Val	Asp	Thr	Glu	Arg	Phe	Glu	Asp	Ala	Val	Gly	Gln	Val	Ile	Glu	Ile	
				2545					2550					2555		
aug	aug	caa	ugg	aac	uuu	agg	gaa	ugc	aag	uau	auc	acc	gau	ugu	gac	7851
Met	Met	Gln	Trp	Asn	Phe	Arg	Glu	Cys	Lys	Tyr	Ile	Thr	Asp	Cys	Asp	
			2560					2565					2570			
cag	auc	uuu	gaa	uca	uug	aac	aug	aaa	gcg	gca	guc	ggU	gcg	uug	uac	7899
Gln	Ile	Phe	Glu	Ser	Leu	Asn	Met	Lys	Ala	Ala	Val	Gly	Ala	Leu	Tyr	
		2575					2580					2585				
agu	ggU	aag	aaa	aag	gcg	uac	uuc	gaa	aaU	ucc	aca	uuu	gau	gau	cga	7947
Ser	Gly	Lys	Lys	Lys	Ala	Tyr	Phe	Glu	Asn	Ser	Thr	Phe	Asp	Asp	Arg	
	2590					2595					2600					
aaU	caU	uug	cua	cag	cuu	agu	ugu	cuc	cga	uua	uuc	aag	ggU	gau	uug	7995
Asn	His	Leu	Leu	Gln	Leu	Ser	Cys	Leu	Arg	Leu	Phe	Lys	Gly	Asp	Leu	
2605					2610					2615					2620	
gga	auu	ugg	aaU	gga	agu	cuu	aaa	gcu	gaa	uua	aga	cca	auu	gaa	aag	8043
Gly	Ile	Trp	Asn	Gly	Ser	Leu	Lys	Ala	Glu	Leu	Arg	Pro	Ile	Glu	Lys	
				2625					2630					2635		
guu	gaa	gca	aac	aaa	acg	cga	aca	uuc	aca	gca	gcu	cca	auu	gaa	acu	8091

Val	Glu	Ala	Asn	Lys	Thr	Arg	Thr	Phe	Thr	Ala	Ala	Pro	Ile	Glu	Thr		
			2640					2645					2650				
uua	cuu	ggc	gga	aag	guu	ugc	guc	gau	gau	uuc	aac	aac	caa	uuu	uau	8139	
Leu	Leu	Gly	Gly	Lys	Val	Cys	Val	Asp	Asp	Phe	Asn	Asn	Gln	Phe	Tyr		
		2655					2660					2665					
gau	cuu	aaU	aug	aaa	ugc	cca	ugg	aca	guc	ggg	aug	acu	aag	uuu	uau	8187	
Asp	Leu	Asn	Met	Lys	Cys	Pro	Trp	Thr	Val	Gly	Met	Thr	Lys	Phe	Tyr		
		2670				2675					2680						
ugc	gga	ugg	aaU	gau	cuu	cua	ggU	aaa	cuu	ccu	gau	ggU	ugg	aua	uac	8235	
Cys	Gly	Trp	Asn	Asp	Leu	Leu	Gly	Lys	Leu	Pro	Asp	Gly	Trp	Ile	Tyr		
		2685			2690					2695					2700		
cgc	gau	gcu	gac	gga	uca	cga	uuu	gac	agu	ucu	cuu	aca	cca	uac	uug	8283	
Arg	Asp	Ala	Asp	Gly	Ser	Arg	Phe	Asp	Ser	Ser	Leu	Thr	Pro	Tyr	Leu		
				2705					2710					2715			
cug	aaU	gca	gug	cuc	ggg	auu	agg	gag	uuu	uuc	aug	gaa	gau	ugg	gac	8331	
Leu	Asn	Ala	Val	Leu	Gly	Ile	Arg	Glu	Phe	Phe	Met	Glu	Asp	Trp	Asp		
			2720					2725					2730				
aua	ggc	gug	cag	aug	cuu	cga	aaU	uug	cac	acu	gaa	aua	auu	uac	acc	8379	
Ile	Gly	Val	Gln	Met	Leu	Arg	Asn	Leu	His	Thr	Glu	Ile	Ile	Tyr	Thr		
		2735					2740					2745					
ccc	auu	gca	aca	ccu	gau	gga	aca	guc	guc	aaa	aag	uuu	cga	gga	aaU	8427	
Pro	Ile	Ala	Thr	Pro	Asp	Gly	Thr	Val	Val	Lys	Lys	Phe	Arg	Gly	Asn		
		2750				2755					2760						
aaU	agu	ggU	caa	ccg	uca	aca	guc	gua	gau	aac	aca	uug	aug	guc	ugu	8475	
Asn	Ser	Gly	Gln	Pro	Ser	Thr	Val	Val	Asp	Asn	Thr	Leu	Met	Val	Cys		
		2765			2770					2775					2780		
auu	ugu	gug	cag	uau	agu	uua	auu	aug	aaU	agu	gua	aag	uuu	gag	aaU	8523	
Ile	Cys	Val	Gln	Tyr	Ser	Leu	Ile	Met	Asn	Ser	Val	Lys	Phe	Glu	Asn		
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Ala	Ile	Asn	Pro	Lys	Phe	Ile	His	Ile	Leu	Asp	Ser	Phe	Lys	Val	His		
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ugg	gau	aga	agu	gua	aaa	cca	gaa	cac	aga	uua	gaa	gcg	auu	ugc	gcu	8811	
Trp	Asp	Arg	Ser	Val	Lys	Pro	Glu	His	Arg	Leu	Glu	Ala	Ile	Cys	Ala		
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ucg	aug	auu	gaa	gca	ugg	ggU	uac	ccu	agg	uua	auc	cac	gaa	auu	cga	8859	

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ucu	gag	gga	aag	gca	cca	uac	auu	ucg	gaa	aca	gcg	cuc	aaa	aga	cuu	8955	
Ser	Glu	Gly	Lys	Ala	Pro	Tyr	Ile	Ser	Glu	Thr	Ala	Leu	Lys	Arg	Leu		
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Tyr	Thr	Cys	Glu	Glu	Gly	Ser	Ala	Asp	Glu	Ile	Met	Ser	Tyr	Leu	Glu		
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Met	Cys	Ala	Ser	Asp	Leu	Asn	Glu	Asp	Glu	Tyr	Phe	Asp	Asp	Glu	Asp		
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guu	ucu	cac	cag	ucc	gcu	cuu	gau	gcu	ggc	aaa	ccc	aca	gca	gaa	aac	9099	
Val	Ser	His	Gln	Ser	Ala	Leu	Asp	Ala	Gly	Lys	Pro	Thr	Ala	Glu	Asn		
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Lys	Asn	Lys	Asn	Lys	Glu	Val	Glu	Lys	Lys	His	Glu	Lys	Thr	Ser	Asn		
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Ser	Ala	Ser	Gly	Ala	Ile	Val	Ser	Asn	Asn	Glu	Lys	Asp	Lys	Asp	Val		
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Thr	Arg	Ala	Ser	Ile	Ser	Gln	Phe	Asn	Thr	Trp	Tyr	Asn	Ala	Val	Lys		
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gaa	ucc	uau	ggU	gug	ucu	gau	gaa	gaa	aug	gga	aua	auu	uug	aaU	gga	9483	
Glu	Ser	Tyr	Gly	Val	Ser	Asp	Glu	Glu	Met	Gly	Ile	Ile	Leu	Asn	Gly		
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uua	aug	guu	ugg	ugu	auu	gaa	aaU	gga	aca	ucu	cca	aac	auu	aaU	ggc	9531	
Leu	Met	Val	Trp	Cys	Ile	Glu	Asn	Gly	Thr	Ser	Pro	Asn	Ile	Asn	Gly		
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Met	Trp	Phe	Met	Met	Gln	Gly	Glu	Glu	Gln	Ile	Glu	Tyr	Pro	Leu	Gln		
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cca	aua	gug	gaa	aac	gca	aaa	ccc	acu	uug	cgu	cag	auu	aug	gcu	cac	9627	

Pro Ile Val Glu Asn Ala Lys Pro Thr Leu Arg Gln Ile Met Ala His
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 Phe Ser Asn Val Ala Glu Ala Tyr Ile Glu Lys Arg Asn Tyr Glu Lys 3180
 3165 3170 3175
 cca uau aug ccg agg uac ggu auu caa cgg aac cuc acc gac aug agu 9723
 Pro Tyr Met Pro Arg Tyr Gly Ile Gln Arg Asn Leu Thr Asp Met Ser 3195
 3185 3190
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 Ala Arg Ala Arg Glu Ala His Ile Gln Met Lys Ala Ala Ala Leu Arg 3225
 3215 3220
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 Asp Ala Asn Asn Lys Met Phe Gly Leu Asp Gly Lys Val Gly Asn Ala 3240
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 Thr Glu Asn Thr Glu Arg His Thr Ala Asp Asp Val Asn His Asn Thr 3260
 3245 3250 3255
 cau gca uuc acc ggc guu cga uau uau uagauuuua ccuaagcaua 9962
 His Ala Phe Thr Gly Val Arg Tyr Tyr 3265
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 uuuaaccuccu auuaucuaug ugucagugag gguagcccuc gugugaucuc uuagaaagua 10082
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 aagcaaggag ggn 10155

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 <212> PRT
 <213> Papaya Leaf-Distortion Mosaic Virus

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 35 40 45
 Leu Gly Cys Thr Asp Arg Cys Ala Gly Leu Ser Ala Tyr Thr Lys Thr
 50 55 60
 Ser Leu Lys Arg Ala Ile Lys Glu Lys Asp Leu Thr Ala Ser Gly Ser
 65 70 75 80
 Cys Phe His Cys Gly Leu Arg Ala Gln Ile Gly Glu Gly Arg Lys Arg
 85 90 95

Val Glu Leu Ala Pro Ile Ser Val Met Glu Asp Val Glu Thr Val Glu
100 105 110
Gln Val Leu Val Pro Cys Met Val Glu Glu Lys Tyr Tyr Lys Glu Val
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Ser Asn Phe Gln Lys Ala Thr Leu Ile Asp Lys Pro Lys Leu Thr Ile
130 135 140
Ala Pro Val Leu Met Ala Gln Pro Ala Gln Val Pro Arg Pro Ala Val
145 150 155 160
Phe Asn Glu Ile Arg Lys Val His Glu Glu Met Lys Ser Gln Thr Ser
165 170 175
Glu Asn Lys Val Leu Glu Glu Glu Thr Gln Cys Ala Ser Asp Ala Ala
180 185 190
Leu His His Leu Asp Asp Val His Ala Cys Arg Ala Arg Ala Gln Val
195 200 205
Gly Ile Glu Arg Ile Leu Ala Arg His Ala Arg His Arg Ile Glu Ala
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Arg Gln Gln Val Glu Glu Glu Gln Ser Glu Ala Leu Ala Ala Phe Glu
225 230 235 240
Ser Phe Phe Asn Gln Thr His Arg Glu Asp Arg Tyr Glu Gly Lys Val
245 250 255
Leu Thr Ile Arg Asn Gly Ile Thr Gly Trp Phe Glu Pro Asn Arg Asn
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Asp Ile Lys Asn Ala Ala Arg Arg Arg Lys Arg Ala Asn Lys Lys Ile
275 280 285
Pro Phe Val Ala Arg Glu Asn Asp Val Ala Arg Ile Glu Thr His Glu
290 295 300
Pro Asn Val Lys Glu Glu Thr Lys Asp Val Glu Glu Ala Thr Asp Thr
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Tyr Thr Phe Lys Lys Gln Arg Asn Asp Lys Lys Arg Val Leu Lys Glu
325 330 335
Asn Val Ser Leu Ser Met Ala Arg Ile Asn Glu Leu Val Arg Cys Val
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Thr Lys Leu Cys Arg Lys Asp Ser Lys Glu Leu Glu Phe Ile Gly Lys
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Arg Gly Ser Leu Arg Val Gln Cys Thr Lys Asn Cys Gly Ser Arg Val
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Ile Leu Arg His Leu Arg Gly Glu Leu Arg Arg Lys Asp Cys Tyr Trp
385 390 395 400
Asp Arg Ile Ile Glu Asn Phe Phe Glu Ile Ala Ala Ala Lys Leu Gln
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Asn Lys Asn Leu Asn Asn Asn Glu Ser Val Arg Arg Gly His Ser Gly
420 425 430
His Ile Ile Gln Tyr Asp Lys Phe Arg Gly Leu Ser Gly Arg His Phe

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Gly	Ser	Tyr	Ile	Ile	Val	Arg	Gly	Ser	Met	Asp	Gly	Arg	Ile	Ile	Asp
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Ala	Arg	Ser	Lys	Ile	Thr	His	Ser	Val	Met	Ile	Asn	Met	Thr	His	Tyr
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Ser	Asp	Ala	Gly	Leu	Ser	Phe	Trp	Lys	Gly	Phe	Asp	Arg	Gln	Phe	Ile
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Asp	Ile	Arg	Asp	Arg	Pro	Lys	Asn	Ala	His	Glu	Cys	Lys	Ala	Thr	Ile
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Asn	Val	Glu	Glu	Cys	Gly	Glu	Met	Ala	Ala	Ile	Val	Asn	Gln	Leu	Leu
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Phe	Pro	Met	Trp	Lys	Ile	Thr	Cys	Thr	Gln	Cys	Gly	Glu	Leu	Leu	Glu
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Met	Leu	Ser	Gln	Glu	Glu	Glu	Leu	Glu	Ser	Phe	Arg	Arg	Lys	Arg	Ser
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Gln	Leu	Ala	Ser	Lys	Leu	Ser	Ser	Leu	His	Ile	Lys	Phe	Pro	Tyr	Val
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Asp	His	Phe	Leu	Asn	Arg	Tyr	Glu	Asn	Ser	Leu	Asn	Arg	Met	Asn	Thr
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Asn	Phe	Asp	Ala	His	Lys	Gln	Ile	Ala	Gln	Ile	Ile	Gly	Ser	Arg	Lys
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Glu	Ile	Pro	Phe	Ser	Asn	Leu	Glu	His	Leu	Asn	Glu	Leu	Leu	Ile	Lys
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Ser	Asp	Lys	Leu	Val	Ser	Glu	Asp	Phe	Tyr	Glu	Met	Ser	Gln	Cys	Leu
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Leu	Glu	Leu	Thr	Arg	Trp	His	Lys	Asn	Arg	Ser	Asp	Ser	Phe	Lys	Lys
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Gly	Glu	Ile	His	His	Phe	Arg	Asn	Lys	Met	Ser	Gly	Lys	Ala	Gln	Phe
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Asn	Phe	Ala	Leu	Met	Cys	Asp	Asn	Gln	Leu	Asp	Lys	Asn	Gly	Asn	Phe
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Val	Trp	Gly	Glu	Arg	Gly	Tyr	His	Ala	Lys	Arg	Phe	Phe	Leu	Asn	Phe
	690					695					700				
Phe	Glu	Lys	Val	Asp	Ser	Thr	Asp	Gly	Tyr	Lys	Lys	His	Ile	Met	Arg
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Val	Asn	Pro	Asn	Gly	Thr	Arg	Gln	Thr	Ala	Ile	Gly	Lys	Leu	Ile	Leu
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Ser	Thr	Asp	Pro	Ser	Thr	Leu	Arg	Gln	Gln	Met	Lys	Gly	Ser	Pro	Ile
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Thr	Arg	Val	Pro	Val	Gly	Lys	Tyr	Cys	Thr	Ser	Lys	Arg	Asp	Gly	Cys
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Tyr	Val	Tyr	Pro	Ala	Cys	Cys	Val	Thr	Met	Glu	Asp	Gly	Thr	Pro	Leu
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Phe Ser Asp Ile Lys Met Pro Thr Lys Asn His Leu Val Ile Gly Asn
785 790 795 800
Ser Gly Asp Pro Lys Tyr Val Asp Val Pro Ser Ser Ser Ser Asp Met
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Ile Val Ala Lys Glu Gly Tyr Cys Tyr Leu Asn Ile Phe Leu Ala Met
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Leu Leu Asn Val Asn Glu Ser Glu Ser Lys Ser Phe Thr Lys Lys Val
835 840 845
Arg Asp Ile Ile Val Pro Arg Leu Gly Gln Trp Pro Ser Leu Ile Asp
850 855 860
Val Ala Thr Glu Cys Tyr Phe Leu Ser Ala Phe His Pro Glu Thr Lys
865 870 875 880
Asn Ala Glu Leu Pro Arg Ile Leu Val Asp His Thr Ser Lys Cys Met
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His Val Ile Asp Ser Tyr Gly Ser Leu Asp Thr Gln Phe His Val Leu
900 905 910
Lys Ala Asn Thr Val Ser Gln Leu Ile Lys Phe Ala Asp Asn Asp Leu
915 920 925
Asp Ser Glu Leu Lys His Tyr Leu Val Gly Gly Asp Leu His Ser Lys
930 935 940
Gln Ala Pro Gln Cys Ser Ile Lys Leu Leu Cys Lys Cys Ile Tyr Arg
945 950 955 960
Pro Lys Leu Met Arg Gln Cys Ile Glu Glu Glu Pro Phe Leu Leu Ile
965 970 975
Leu Ala Cys Ile Ser Pro Gly Val Leu Leu Ala Leu Tyr Asn Ser Gln
980 985 990
His Leu Glu Leu Ala Leu Lys Tyr Trp Met Ser Lys Gln Gln Ser Val
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Ala Ala Leu Phe Ala Met Ile His Gly Leu Ala Ala Lys Val Thr Val
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Ala Gln Thr Leu Asn Glu Gln Arg Leu Ile Leu Glu Arg Gly Ala Arg
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Asn Leu Ile Ser Val Met Glu Thr Ile His Met Thr Ser His Ser Tyr
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Gln Pro Ala Leu Leu Gln Leu Gln Val Met Ala Asn Arg Arg Asp Met
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Asn Ser Thr Leu Asp Leu Ala Gly Phe Ser Ile Leu Gln Ser Glu Asp
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Ser Met Tyr Trp Met Glu Lys Ser Tyr Leu Met Glu Leu Glu Asp Ser
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Trp Asn Asp Leu Lys Trp Leu Glu Lys Leu Gln Glu Met Trp Arg Leu

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Ser Lys Tyr Ser Ile	Ser Gly Ile Ser Gln Leu Ser Met Lys Gly Ala		
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Thr Asp Leu Gly Gly Arg Tyr Ser Val Ser Ala Lys Gln Phe Ile Thr			
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Ser Val Met Lys Pro Val Lys Lys Ser Cys Val Lys Ala Arg Asp Thr			
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Cys Lys Glu Val Ile Ile Asn Thr Thr Ser Trp Thr Phe Arg Ala Thr			
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Phe Ser Leu Cys Arg Trp Cys Leu Pro Asp Cys Leu Lys Phe Ile Asn			
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Met Leu Ile Val Ile Ser Leu Ile Leu Ser Ile Trp His Ser Ala Asn			
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Ser Ile Ser Phe Asp Tyr Ala Gln Met Lys Arg Glu Lys Gln Val Asn			
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Ile Glu Lys Val Leu Met Asn Asn Leu Val Ala Leu His Lys Glu Gln			
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Ile Lys Ile Asn Pro Asp Leu Thr Lys Glu Glu Phe Lys Glu Tyr Ile			
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Ala Arg Ser Arg Pro Glu Leu Ile Ala Leu Val Asn Lys Glu Leu Gln			
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Glu Glu Val Asp His Gln Ala Lys Arg Lys Gly Glu Gln Asn Leu Glu			
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Lys Ile Ile Ala Phe Val Ala Leu Val Met Met Ile Phe Asp Ser Glu			
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Glu Gly Ser Lys Val Thr Glu Phe Lys Glu Met Asn Phe Ala Ala Trp			
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Trp Glu Lys Gln Leu Gln Cys Asp Arg Val Val Pro His Tyr Arg Thr			
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Thr Gly Lys Phe Ile Glu Phe Thr Arg Glu Ser Cys Val Ser Val Ser			
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Asn Thr Ile Ser His Ala Pro Glu Lys Glu Trp Ile Val Arg Gly Gly			
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Val Gly Ser Gly Lys Ser Thr Gly Leu Pro Phe Ala Leu Ser Ser Lys			
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			1440

Gly Ala Val Leu Met Leu Glu Pro Thr Arg Pro Leu Ala Glu Asn Val
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 Ser Gly Phe Ala Phe Asn Tyr Phe Ala Asn Asn Pro Leu Lys Leu Ser
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 Thr Gln His Pro Val Ser Ile His Ile Glu Glu Gln Leu Ser Phe Gln
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 Lys Gly Asp Asn Ile Leu Val Tyr Val Ala Ser Tyr Asn Glu Val Asp
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 Gln Leu Ser Lys Met Leu Gly Asp Lys Gly Tyr Leu Val Thr Lys Val
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 Asp Gly Arg Thr Met Lys Ile Gly Ser Thr Asp Ile Val Thr Lys Gly
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 Ser Ser Gln Lys Lys His Phe Ile Val Ala Thr Asn Ile Ile Glu Asn
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 Gly Val Thr Leu Asp Val Asp Val Val Val Asp Phe Gly Leu Lys Val
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 Thr Ala Glu Ile Asp Tyr Asp Asn Arg Cys Val Asn Tyr Thr Lys Thr
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 Ser Ile Ser Tyr Gly Glu Arg Ile Gln Arg Leu Gly Arg Val Gly Arg
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 Thr Tyr Gly Leu Pro Val Met Thr Gln Gly Val Ser Val Asn Ser Leu
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 Ser Asn Cys Thr Val Arg Gln Ala Arg Val Met Ser Arg Phe Glu Leu
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Pro Pro Tyr Phe Met Ala Ser Leu Val Tyr His Asp Gly Ser Met His
 Page 19

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Tyr	Arg	His	Leu	Trp	Glu	Asp	Ile	Leu	Lys	Ile	Lys	Ser	Ile	Asn	Cys
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Ser	Asn	Ile	Glu	Glu	Val	His	His	Glu	Gly	Lys	Arg	Lys	Thr	Gln	Lys
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Arg	Phe	Val	Ser	Met	Tyr	Gly	Val	Asn	Leu	Glu	Asp	Phe	Ala	Phe	Ile
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Arg	Tyr	Ile	Asp	Pro	Ile	Thr	Gly	Ala	Thr	Arg	Asp	Glu	Ser	Pro	Leu

2100					2105					2110					
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